

DRAFT

WORK PLAN FOR DRUM INVENTORY

**ENVIRO-CHEM SUPERFUND SITE
ZIONSVILLE, INDIANA**

Prepared For:

**ENVIRONMENTAL CONSERVATION AND
CHEMICAL CORPORATION TRUST**

Prepared By:

**AWD TECHNOLOGIES, INC.
PITTSBURGH, PENNSYLVANIA**

AWD PROJECT NUMBER 2455.002

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June 14, 1994

Ms. Karen Vendl
Remedial Project Manager
U.S. Environmental Protection Agency
Region V
77 West Jackson Boulevard
Chicago, Illinois 60604

Subject: Enviro-Chem Superfund Site
Drum Inventory Work Plan
AWD Project Number 2455.002

Dear Karen:

Enclosed is a draft copy of the Drum Inventory Work Plan for the Enviro-Chem Superfund Site. This work will be the initial step in the drum removal activity. The Drum Removal Specification will be prepared after completion of the inventory.

If you have any questions on this matter, please feel free to call me at (412) 788-2717.

Sincerely,

A handwritten signature in cursive script that reads "Mark J. Dowiak".

Mark J. Dowiak, P.E.
Project Manager

MJD/slk

cc: Jim Smith, IDEM
T. Harrison, CH2M Hill
Roy O. Ball, Ph.D.
Norman W. Bernstein, Esq.
John M. Kyle, III, Esq.

TABLE OF CONTENTS

<u>SECTION</u>		<u>PAGE</u>
1.0	PROJECT DESCRIPTION	1-1
1.1	Site Location	1-1
1.2	Site Description	1-1
1.3	Summary of Work	1-3
1.4	Project Objectives	1-5
2.0	SCOPE OF WORK	2-1
2.1	Support Zone Operations	2-1
2.1.1	General	2-1
2.1.2	Site Plan	2-1
2.1.3	Electrical Supply	2-1
2.1.3.1	Office and Support Trailers	2-2
2.1.4	Water Supply	2-2
2.1.5	Traffic Control	2-2
2.1.5.1	Access from State Route 421	2-2
2.1.5.2	Support Zone Entrance and Exit	2-3
2.1.6	Decontamination Pad	2-3
2.1.7	Wastewater Storage Pad	2-3
2.2	Site Operations Plan	2-4
2.2.1	Health and Safety Plan	2-4
2.2.2	Testing Laboratory Quality Assurance Plan	2-4
2.3	Drum Inventory	2-5
2.3.1	Drum Integrity Evaluation	2-6
2.3.2	Remote Opening	2-7
2.3.2.1	Bung Spinner	2-8
2.3.2.2	Remote-Controlled Drill	2-8
2.3.2.3	Drum Piercer	2-8
2.3.3	Drum Opening and Sampling	2-9
2.3.3.1	Drum Sampling Equipment	2-9
2.3.3.2	Procedures	2-9
2.3.4	Segregation and Staging	2-11

TABLE OF CONTENTS (continued)

<u>SECTION</u>		<u>PAGE</u>
2.3.5	Sampling Equipment Decontamination	2-11
2.3.5.1	General	2-11
2.3.5.2	Decontamination Equipment	2-12
2.3.5.3	General Equipment Decontamination Procedure	2-12
2.3.6	Sample Handling and Tracking	2-13
2.3.6.1	Sample Identification	2-13
2.3.6.2	Field Documentation	2-14
2.3.6.3	Chain-of-Custody	2-16
2.3.6.4	Sample Packaging and Shipping	2-16
2.4	Final Report	2-17

APPENDICES

A	HEALTH AND SAFETY REQUIREMENTS
B	COMPATIBILITY TESTING

FIGURES

<u>NUMBER</u>		<u>PAGE</u>
1-1	Site Location	1-2
2-1	Drum Data Form	2-15

TABLES

<u>NUMBER</u>		<u>PAGE</u>
1-1	Drum Storage Area Inventory Summary Table	1-4

DRAWINGS

<u>NUMBER</u>	
C-1	General Site Conditions
C-2	Operations Plan

1.0 PROJECT DESCRIPTION

1.1 Site Location

The Enviro-Chem Superfund Site (the "Site") is located in Boone County, Indiana, approximately 5 miles north of Zionsville and 10 miles northwest of Indianapolis. Access to the Site is by State Route 421 (see Figure 1-1).

1.2 Site Description

The Site is defined as the area bounded by the new perimeter fence, which includes the 3.05-acre Remedial Boundary, the Support Zone, and the buffer zones between the perimeter fence and Remedial Boundary on the north and east sides of the Site. The Remedial Boundary encompasses the former waste processing facility and support areas (see Drawing C-1).

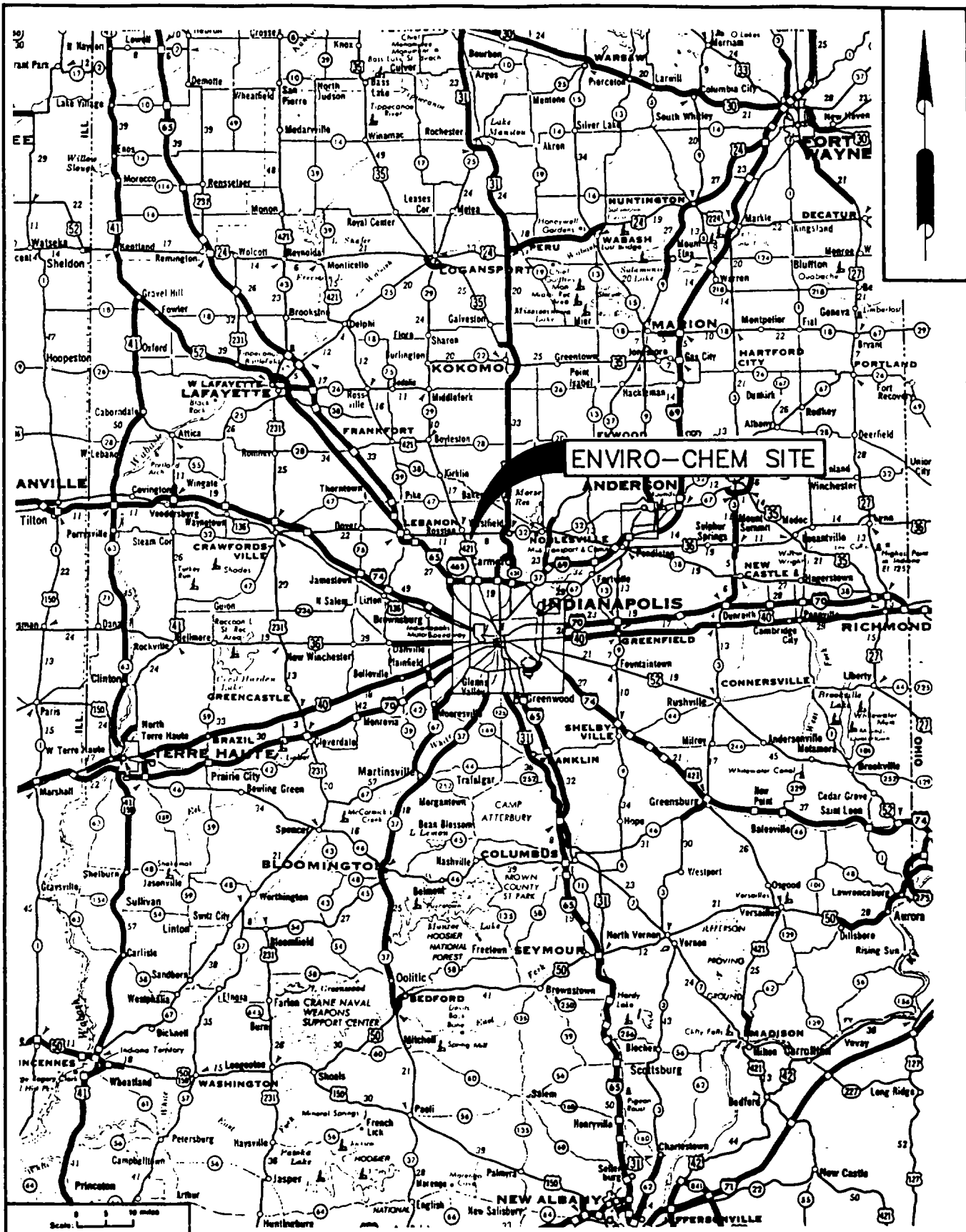
Directly west of the Site is an active commercial waste handling and recycling facility operated by the Boone County Resource Recovery Systems, Inc. (BCRRS). Access to the Site will be from State Route 421 and will be shared with BCRRS.

Directly east of the Site across an unnamed ditch is the inactive Northside Sanitary Landfill (NSL) landfill. This facility is also a Superfund site and is presently undergoing remedial design activities. The south end of the Site is approximately 500 feet from an existing residence and is approximately 400 feet from Finley Creek, the main surface water drainage in the Site area.

Site preparation and materials removal activities were undertaken in 1993 which resulted in the construction of a Support Zone and removal of all background waste, structures, tanks, and debris in the Site area. The Support Zone includes a new concrete decontamination pad and a wastewater storage pad. Diversion channels were constructed along the western edges of the Support Zone and the Remedial Boundary, and a chain link fence was installed continuously along the Site perimeter. The Support Zone area was graded and a 12-inch thick aggregate pavement was placed over the area.

being redefined

*SPMR
Support
Zone
decontamination
pad
wastewater
storage
pad*



AWD TECHNOLOGIES, INC



SITE LOCATION MAP
ENVIRO-CHEM SITE, ZIONSVILLE, IN

SCALE: AS SHOWN

FIGURE NUMBER 1-1

REV 0

The area within the Remedial Boundary contains the foundations and adjoining concrete slabs from the former process buildings, and a concrete pad used for storage of drums and other materials during operation of the waste processing facility.

Approximately 295 55-gallon drums are clustered on the concrete pad located within the south end of the Remedial Boundary (see Table 1-1). These drums are believed to contain soil cuttings from drilling operations, groundwater from monitoring well purging, decontamination water, and chemical protective clothing generated during prior investigations at the Site and the Northside Sanitary Landfill (NSL). Ten drums were added to the Site following AWD's field operations conducted during the Supplemental Site Investigations - Phase 1 and Phase 2. Twenty-five (25) additional new drums were added to the Site during the site preparation and material removal activities.

1.3 Summary of Work

The existing drums will be addressed using a two-stage approach. The first stage will be a detailed inventory and is addressed by this Work Plan. This stage will include drum opening, general characterization, compatibility testing, and staging.

Compatibility testing refers to simple, rapid, and cost-effective testing procedures that are used to segregate wastes into broad categories (i.e., oxidative and waste reactive). By identifying broad waste categories, compatible waste types may be safely bulked onsite without risk of fire or explosion, and disposal options can be determined without exhaustive and costly analysis of each drum. Also, if drums are shipped offsite, compatibility testing will identify which materials can be hauled in the same load in accordance with U.S. DOT requirements.

The second stage is the offsite disposal which will be initiated after the drum inventory is completed. This stage of work will be performed separately from the drum inventory and is not addressed by this Work Plan.

TABLE 1-1		
DRUM STORAGE AREA INVENTORY SUMMARY TABLE		
Quantity of Drums	Condition	Comments
260 ±	Poor: Deteriorated	Drums from the Enviro-Chem Site, the Northside Sanitary Landfill, and the Third Site contained soil cuttings from drilling operations, groundwater, decontamination water, and chemical protective clothing. Several drums are unmarked as to their contents or source of contents. Some drums have rusted open and now contain nothing. (Inventory performed on November 13 and 14, 1992.)
10	New: Able to be shipped as is	Eight drums contain soil cuttings, decontamination water, groundwater, and chemical protective clothing from activities on the Enviro-Chem Site generated by AWD. Two unused drums remain empty. (Inventory performed on November 13 and 14, 1992.)
25	New: Able to be shipped as is	These drums are a result of site preparation and material removal work performed at the Site in 1993.

Notes

1. All drums are 55-gallon.

1.4 Project Objectives

The objectives of the drum inventory project are to:

- Assess the contents of each drum and provide compatibility testing on unclassified drums.
- Label each drum and stage drums on the concrete pad by waste category and compatibility.

The drum inventory will be performed by a Contractor selected by the Enviro-Chem Trustees.

—

2.0 SCOPE OF WORK

The scope of work for implementation of the drum inventory is described in this section. Requirements for health and safety and procedures for waste sample compatibility testing are contained in Appendices A and B respectively.


2.1 Support Zone Operations

2.1.1 General

The following provides information on the layout of office and support facilities/utilities for the Support Zone and adjacent work and operations areas.

2.1.2 Site Plan

The planned layout of the Support Zone is indicated on Contract Drawing C-2. This site plan indicates the location of support trailers, decontamination and containment pads, parking areas, and other work areas in and adjacent to the Support Zone during the Site mobilization.

The limits of the Support Zone are defined by the new fence on the west and south boundary of the Site and the exclusion zone on the east. The exclusion zone will be set back 25 feet from the Remedial Boundary. No operations shall be conducted within the Remedial Boundary area, except for the concrete pad area and a direct access route between the concrete pad and the Support Zone. 

2.1.3 Electrical Supply

Electrical power has been provided from the power lines on State Route 421 to a construction panel in the field trailer area. The existing power supply is 120/240 volt, 600 amp single phase. The Contractor shall provide all labor, equipment, and materials required to provide and install electrical service and lighting to the Support Zone facilities as necessary.

All wiring shall be mounted above ground. All circuits throughout the construction site shall be protected either by a ground fault circuit interrupter or an approved grounding system.

At the completion of onsite activities by the Contractor and if elected by the Enviro-Chem Trustees, the Contractor shall disconnect the temporary electrical service to the Support Zone facilities, and remove all electrical wiring and lighting. All wiring, lighting, and electrical fixtures shall remain the property of the Enviro-Chem Trustees for possible use in the next phase of remedial activity.

2.1.3.1 Office and Support Trailers

The Contractor shall provide electrical service to the following office and support trailers. This service shall meet the minimum requirements listed below:

Facility	Voltage	Minimum Amperage
Contractor Office Trailer	240/120 volts	100 amps
Mobile Laboratory (Optional)	Per Contractor Requirements	

2.1.4 Water Supply

Water storage facilities for decontamination and potable water requirements shall be provided by the Contractor. All water sources for decontamination and environmental control requirements shall be approved by the Enviro-Chem Trustees.

2.1.5 Traffic Control

All vehicles involved in drum inventory activities shall be subject to traffic control requirements as follows.

2.1.5.1 Access from State Route 421

All vehicles will enter and exit the Site area by an existing access road intersecting with State Route 421. Drum inventory activities will share Site access from State Route 421 with Boone County Resource Recovery Systems, Inc. (BCRRS). This access road is partly within a non-exclusive access easement held by the NSL Landfill Trustees. Coordination of access to and from both the Site and the NSL Site will be worked out by representatives of both sites and

BCRRS prior to implementation of this plan. The access road intersection with State Route 421 is near the existing office facility operated by BCRRS. All vehicles traveling on the access roads between the Support Zone and State Route 421 shall coordinate their movement with traffic and other activities involving BCRRS and the NSL Landfill remediation.

2.1.5.2 Support Zone Entrance and Exit

The Support Zone shall be within a continuously fenced area that will have one operating gate as follows:

- Main Gate, located at the southwest perimeter of the Site. This gate shall be used as the only vehicle entrance and exit to the Support Zone. Vehicles shall exit the main gate only if they are decontaminated or have not been within the exclusion zone, otherwise, they must be decontaminated.

All personnel and vehicle ingress and egress for the Support Zone will be by the main gate only. The equipment laydown area will be accessed by its own gate. The north and northwest gates shall be locked and shall not be used during the drum inventory activities.

2.1.6 Decontamination Pad

The existing decontamination pad will not be used during the drum inventory work. A separate personnel and equipment decontamination area will be established near the concrete pad area by the Contractor in accordance with general health and safety requirements (see Section 2.2.1).

2.1.7 Wastewater Storage Pad

The existing wastewater storage pad will not be used during the drum inventory work. Any wastewaters generated by the Contractor, with the exception of sanitary wastes, shall be placed in new 55-gallon drums (U.S. DOT approved) and staged onsite.

2.2 Site Operations Plans

2.2.1 Health and Safety Plan

The Contractor shall prepare and implement a site-specific Contractor Health and Safety Plan (CHSP) for use during implementation of the drum inventory activities. The Contractor shall comply with the requirements of this Work Plan (see Appendix A) for preparation of the CHSP.

The CHSP shall include procedures for decontamination, spill control, and contingency planning. Suitable sorbent materials shall be readily available at each drum handling area to enable control and collection of any spilled liquid or semi-solid drummed materials. All spilled materials and absorbents shall be placed into new 55-gallon drums (U.S. DOT approved) and staged onsite.

2.2.2 Testing Laboratory Quality Assurance Plan

Unclassified drum contents will be analyzed for chemical compatibility to provide a general characterization for staging and subsequent transportation. Sample testing may be performed either onsite in a mobile laboratory or offsite in a fixed-based laboratory. The type of laboratory used shall be selected by the Contractor.

The Contractor shall submit a Testing Laboratory Quality Assurance Plan to the Enviro-Chem Trustees prior to proceeding with Support Zone operations (see Section 2.1). The QA Plan shall include at a minimum the following elements for the proposed testing as described in Appendix B:

- Major equipment list
- Key operational personnel resumes
- Equipment calibration procedures
- Duplicate or sample replicate analyses (if applicable for method)
- Analyses of standards or known matrices
- Documentation and recordkeeping
- Mobile laboratory operations plan (if mobile lab is used), including
 - Guidance regarding the hook-up of power and telephone service
 - Procedures addressing the disposal of laboratory waste
 - Materials and supply resources

- Towing and transport considerations
- Housekeeping requirements

2.3 Drum Inventory

Each of the onsite drums will be examined, opened in-place, and, if necessary, sampled for compatibility testing. Based on all available information, including preliminary surveys of drum conditions, five general categories of drummed materials are present onsite:

- Empty drums
- Drill cuttings (solids)
- Purge and decontamination waters (liquids)
- Personnel protective equipment (PPE) and miscellaneous solid waste (solids)
- Unclassified materials

Drums which are determined to contain materials other than those accumulated during previous investigations, and those drums with contents not discernable by markings or visual inspection shall be considered "unclassified" materials and will require compatibility sampling and testing (see Appendix B). Additionally, 10 percent of the purge and decontamination water drums will be tested to confirm their waste category. All other drum categories will not require compatibility testing. The number of each category of drums has not been determined, although the number of unclassified drums is expected to be minimal.

Based on the compatibility testing, the drums shall be segregated into the following 13 potential waste categories:

1. Reactive and Ignitable Materials (Liquids or Solids)
 - Peroxides and oxidizing agents
 - Reducing agents
 - Water-reactive compounds
 - Flammable materials

2. Water insolubles (liquids)

- Low halogen
- Mixed halogen
- High halogen

3. Acids (liquids)

- Strong (pH < 2)
- Weak (pH 2 to 7)

4. Bases (liquids)

- Strong (pH > 12)
- Weak (pH 7 to 12)

5. Solids

- Drill cuttings and soils
- PPE and miscellaneous solid waste

Empty drums shall be placed in a separate staging area and they shall be labeled as such.

2.3.1 Drum Integrity Evaluation

Prior to handling any drum, a visual inspection and organic vapor meter (OVM) scan will be performed on the drum exterior. Drums which appear to be under pressure (bulging) shall be identified for remote opening. Drums producing organic vapor readings above 10 ppm shall be opened in Level B respiratory protection or the drums shall be opened remotely, as determined by the Contractor.

An initial visual survey of the drums shall be performed by the Contractor. This survey shall consist of the following:

- Drums shall be numbered (from D-1 through D-295±) and marked with paint.
- The drums shall be classified based on their condition. The Contractor shall identify the following classes of drums:
 - Deteriorated and unsafe to move (DUM).
 - Deteriorated but safe to rearrange (DSR).
 - Not deteriorated and safe for transportation (NDST).
 - Bulging drums.

Drums that are classified as DUM shall be overpacked in place. Bulging drums shall be opened by remote means (see Section 2.3.2).

Drums thought to be explosively air or water reactive, if encountered, shall not be handled. Air or water reactive waste drums will require special handling measures. These drums shall be left in-place and shall be addressed at a later time after consultation with U.S. EPA.

2.3.2 Remote Opening

Because of the possibility that bulging/pressurized drums will be encountered, equipment that will enable such drums to be opened remotely will be available onsite. Such equipment will be described in the CHSP. Regardless of whether or not a drum is bulging, all bung lids shall be opened slowly to relieve pressure.

Most of the drums onsite have been exposed to the environment for several years. Oxidation may have occurred and fused the lid to the drum, or the bung may be deteriorated to the point that a wrench will not work. The use of some specialized equipment to gain access to the drum contents may be required. The following are suitable methods of gaining access to drum interiors, and can be used remotely at safe distances.

2.3.2.1 Bung Spinner

The bung spinner consists of:

- Air impact wrench with non-sparking adapter
- Drum-mounting bracket
- Two-stage regulator
- Compressed-air cylinder with 100 feet of air hose and control valve

The impact wrench is mounted over the bung on top of the drum by means of the steel-mounting bracket. The air tank, regulator, and control valve can be placed up to 100 feet away from the drum in a well-protected location.

2.3.2.2 Remote-Controlled Drill

The remote-controlled, air-operated, self-feeding, and self-retracting drill consists of:

- Self-feeding and self-retracting drill
- Drum-mounted bracket
- One hundred feet of air hose and control valves
- Two-stage high-pressure regulator
- Compressed-air cylinder
- Filter/regulator/lubricator unit

As with the bung spinner, the air tank, regulator, and control valves can be placed up to 100 feet away from the drum in a well-protected location. There are two controls on this piece of equipment, a start valve and an emergency retract valve.

2.3.2.3 Drum Piercer

The drum piercer consists of:

- Hydraulic ram with hand pump
- One hundred feet of hydraulic hose

- Drum-mounting bracket (top or side)
- Piercing nail

This unit uses the same bracket as the drum drill. The hydraulic ram slowly forces the steel piercer through the drum surface as the hand pump is operated. When the 1/2-inch diameter hole is complete, opening a relief valve on the pump allows the spring to retract the piercer from the hole.

2.3.3 Drum Opening and Sampling

All onsite drums shall be opened to assess their general waste characteristics.

Unclassified drums and 10 percent of the identifiable liquid drums shall be opened and sampled for compatibility testing. All other drums will not require sampling.

2.3.3.1 Drum Sampling Equipment

- Bung wrench
- 15/16 inch open end and/or socket wrench
- Glass sampling tubes (liquids)
- Coliwasa tubes (liquids/solids)
- Stainless steel coring tube with plastic liners (solids)
- Drum markers
- Trowels or stainless steel spoons
- Sample containers

2.3.3.2 Procedures

Procedures for collecting drum samples for compatibility testing are outlined below.

1. Record any markings, special drum conditions, and type of opening in the field notebook.
2. Mark drum with an identification number and record same in logbook.

3. Make certain that the drum is set on firm base, preferably in a fully upright position.
4. Prepare sample containers.
5. Exercising caution, open the bung top or drum lid slowly. Use a remote opener if the drum is bulging.
6. For **liquids** insert glass tubing almost to the bottom of the drum or until a solid layer is encountered. About 1 foot of tubing should be exposed above the drum. For solids, if they are viscous enough to allow penetration by the glass tube, push the tube until solid refusal (hopefully drum bottom).

Allow the waste in the drum to reach its natural level in the tube. Place thumb or tapered stopper over the top of the sampling tube.

Carefully remove the tube from the drum and insert into sample container. Release thumb or remove stopper and allow the glass thief to drain completely into the sample container. (Note: If using a Coliwasa sampler, wipe the sample tube with a disposable cloth while removing the tube from the drum.) If solids and liquids are in the drum, note all phases, and pour off liquids out of the top of the glass tube into sample container. The glass tube may be broken off and left inside the drum being sampled.

7. For **solids** push the coring tube into the solids material until refusal. Remove the tube and extrude the sample into a stainless steel bowl, or immediately into the sample containers if possible.

The coring tube liners shall be discarded after each use, and the stainless steel coring tube shall be decontaminated between drum samples.

8. Cap the sample container tightly and place in container carrier. Make sure that sample has been labeled and identified.
9. Replace the bung or drum lid and secure.

2.3.4 Segregation and Staging

Following the drum integrity evaluations and drum opening, all identifiable drums that will not require compatibility testing will be physically moved and staged at the existing concrete pad according to identifiable contents. The drums to be sampled will be staged after evaluation of compatibility test results. The general categories for staging are as described in Section 2.3, in addition to any categories identified during the compatibility testing.

The staging area shall be on the north half of the concrete pad. Drums will be staged in a manner as to provide access for removal of any liquid content and for future sampling for offsite disposal. Generally, staging shall be by rows of two adjoining drums, with a minimum 3-foot spacing between rows.

Overpacks which may be required for DUM drums, should have all original identifiable drum markings recorded in field logbooks and on the outside of the overpack drum. Overpacked drums shall be staged with other drums in the appropriate category.

Equipment used for handling the drums shall be suitable for safely lifting and transporting the drums and overpacked drums on the concrete pad without causing any physical damage to the pad.

2.3.5 Sampling Equipment Decontamination

2.3.5.1 General

The following describes standard operating procedures for the decontamination of equipment and tools that may come into direct contact with a field sample intended for analysis. This procedure only addresses the decontamination of equipment as it pertains to the chemical integrity of samples for analysis and is not intended for use in health and safety decontamination of personnel, materials, and equipment that may become contaminated during field operations.

2.3.5.2 Decontamination Equipment

All equipment will be considered contaminated unless determined otherwise. All equipment necessary for a field task shall be decontaminated prior to mobilization. In this way, field decontamination will be limited.

The following equipment is needed for equipment decontamination:

- Clean disposable rubber gloves
- Wastewater container (drum)
- Clean water spraying device
- Clean brushes
- Plastic garbage bags
- Acetone or methanol in squirt bottle (squirt bottle is not recommended for transportation)
- Deionized/distilled water (DI water)
- Clean buckets and other containers, as needed (small plastic swimming pool)
- Plastic ground sheet (Visqueen)
- Aluminum foil
- Package labels and pen
- Potable water, warm if available
- Steam cleaner (optional)
- Non-phosphate detergent

2.3.5.3 General Equipment Decontamination Procedure

The following steps will be considered the sampling equipment decontamination procedure:

- Cover hands with disposable rubber gloves.
- Wash and scrub as necessary with a solution of non-phosphate detergent and potable water (warm water if available). Thorough steam cleaning may be used as a substitute for this step.
- Rinse thoroughly with potable water (warm water if available).
- Rinse with DI water.
- Rinse with acetone or methanol.

- Rinse with DI water.
- Air dry.

All waste liquids and solids generated by the decontamination procedure will be containerized in U.S. DOT approved 55-gallon drums which shall be staged onsite on the concrete pad.

Decontaminated equipment not intended for immediate use may be placed in plastic bags and sealed. All handling of decontaminated equipment will be performed using disposable rubber gloves. Care will be exercised in the storage of decontaminated equipment. Sampling equipment will avoid contact with solvents, greases, oils, gasoline, water, dusts, and other potential sources that might contaminate the equipment before use.

2.3.6 Sample Handling and Tracking

2.3.6.1 Sample Identification

Each sample collected will be assigned a unique identification number and placed in an appropriate sample container. Each sample container will have a sample label affixed to the outside with the date, time of sample collection, site name, type of sample, and sampler's name recorded on the label. In addition, this label will contain the sample identification number, analysis required and chemical preservative added, if any. All documentation will be completed in waterproof ink.

The sample identification number will be a unique alphanumeric code which will identify the project site, sample location, sample type, and sample number. The sample ID for specific locations will have the following for group identifiers:

Site Code - Sample Type - Sample Number

The alphanumeric code for each sample will initiate with the three-letter project site code: ECC.

The sample type identifiers will be as follows:

- DRS - Drum Solid
- DRL - Drum Liquid

For example, the first sample from an unclassified drum may be identified as:

ECC-DRL - 01

2.3.6.2 Field Documentation

Field notebooks and drum data forms will be maintained by the Contractor to record all data collecting activities performed at the Site. Entries will be as descriptive and detailed as necessary so that a particular situation can be reconstructed without reliance on the collector's memory.

At a minimum, field notebook entries will consist of the following:

- Date
- Start date
- Weather
- Field personnel present
- Signature of the person making the entry
- Type of activity conducted
- Sampling location
- Sample identification number
- Description of depth of sampling point
- Type of sample (matrix)
- Pertinent field observations

All measurements made and samples collected will be recorded. All entries will be made in indelible ink. No erasures will be permitted. If an incorrect entry is made, the data will be crossed out with a single strike mark and initialed. Entries will be organized into easily understandable tables, if possible.

A drum data form will be prepared for each drum that describes its condition, any unusual markings, and the location where it was stored and staged (see Figure 2-1).

FIGURE 2-1
DRUM DATA FORM

Sampling Drum ID: _____

Date Sampled: _____

Time: _____

Estimated Liquid Quantity: _____

Site Location: _____

Staging Location: _____

Sampler's Name: _____

Drum Condition: _____

Physical Appearance of the Drum Contents: _____

Odor: _____

Color: _____

pH: _____

% Liquid: _____

Date of Analysis: _____

Laboratory Analytical Data: _____

Compatibility: _____

Hazard: _____

Waste ID: _____

Treatment Disposal Recommendations: _____

2.3.6.3 Chain-of-Custody

To maintain and document sample possession, the following chain-of-custody procedures will be followed. A chain-of-custody record will be completed once the samples are brought to the onsite sample receiving area. This record will include, but not be limited to, the following information:

- Project name and number
- Name(s) of sampler
- Sample identification number and location
- Date and time of collection
- Number and type of containers
- Required analyses
- Preservatives
- Courier
- Signatures documenting change of sample custody

Chain-of-custody forms will accompany any and all samples which are shipped offsite. They will not be required if an onsite laboratory is used. When transferring possession of the samples, the individuals relinquishing and receiving the samples will sign, date, and note the time of transfer on the record. A commercial delivery service (for example, Federal Express) will be identified by company name only. Additionally, the samples will remain in the physical possession of the person assigned to the sample until they are shipped to the laboratory or will be placed in a locked storage facility prior to shipping. The original chain-of-custody record will accompany the sample to the analytical laboratory and will be returned to the Contractor with the analytical results. A copy of each record will be placed in the project file.

2.3.6.4 Sample Packaging and Shipping

Samples will be shipped as environmental samples according to applicable guidance documents and U.S. DOT regulations.

2.4 Final Report

At the conclusion of the field inventory activities and upon receipt of all analytical data, the Contractor shall prepare a Final Report on Drum Inventory. The report shall include the following:

- General description of Site activities.
- Description of field sampling and analytical methods (by reference as appropriate).
- Tabulation of individually numbered drums including condition, waste contents, and compatibility test results, if sampled.
- As-built drawing indicating the location of the drum staging area and the individual drum type groupings.
- Completed drum data forms.

APPENDIX A

HEALTH AND SAFETY REQUIREMENTS

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01390 - HEALTH AND SAFETY

PART 1 - GENERAL

1.01 SUMMARY

- A. This section covers the technical requirements and guidelines for preparation of the Contractor's Health and Safety Plan (CHSP). This plan shall establish, in detail, the protocols necessary for the recognition, evaluation, and control of all hazards associated with each task performed by the Contractor and its subcontractors, and shall comply with all applicable laws and regulations including OSHA.

1.02 RESPONSIBILITIES

- A. The CHSP shall be prepared by the Contractor and submitted to the Enviro-Chem Trustees Engineer. The approved CHSP, complete with all comments addressed, shall become part of the Contract Documents.
- B. Project Management:
 - 1. The Contractor shall be responsible for the implementation and enforcement of all health and safety practices as described/outlined in the CHSP. This would include, but not be limited to, all precautions for safety and would provide the necessary protection to prevent damage, injury, or loss to work equipment or materials, property including adjacent property, Contractor, subcontractor, and other authorized personnel.
- C. Health and Safety Officer:
 - 1. The Contractor shall utilize the services of an industrial hygienist certified by the American Board of Industrial Hygiene in Comprehensive Practice to serve as the Health and Safety Officer (HSO). The HSO will be responsible for developing and implementing the CHSP, conducting initial onsite training, and providing onsite consultation to ensure the CHSP is fully implemented. The HSO shall also be part of the Quality Control (QC) staff. The qualifications of the HSO shall include:

- a. Minimum of 3 years experience in developing and implementing health and safety programs at hazardous waste sites.
 - b. Demonstrated experience in supervising professional and technician level personnel.
 - c. Demonstrated experience in developing worker exposure assessment programs and ambient air monitoring programs including the siting of monitoring and meteorological stations.
 - d. Demonstrated experience in the use of computerized data bases to compile, collate, and analyze exposure data.
2. The name, qualifications, and work experience of the HSO shall be submitted along with the Contractor's Bid. Any substitution of this position must be requested by the Contractor in writing and formally approved by the Engineer.

D. Site Safety Officer:

1. The Site Safety Officer (SSO) shall assist and represent the HSO in the implementation and enforcement of the CHSP. The SSO shall be assigned to the project on a full-time basis and shall be a Contractor's employee who reports to the HSO in matters pertaining to site safety and health. The SSO shall be responsible for the day-to-day administration of the overall program and implementation of the CHSP. The qualifications of the SSO shall include:
 - a. A minimum of 2 years working experience at hazardous waste sites with demonstrated experience in working with Level B personal protective equipment.
 - b. Demonstrated knowledge of drum handling techniques and procedures.
 - c. A working knowledge of Federal and state health and safety regulations.

- d. Specific training in personal and respiratory protective equipment program implementation and in the proper use of air monitoring instruments and procedures. Such training shall be conducted by the HSO or with the concurrence of the HSO.
 - e. Certification as having completed Cardiopulmonary Resuscitation/Basic Life Support (CPR/BLS) (American Heart Association and/or American Red Cross).
2. The name, qualifications (education summary and documentation), and work experience of the SSO shall be submitted and approved by the Engineer prior to commencement of the Contractor's work at the Site. Duties of the SSO shall include, but not be limited to, the following:
- a. Review and confirm changes in personal protective clothing or respiratory protection requirements.
 - b. Ensure that all workers entering the Site have appropriate medical examinations and hazardous waste training.
 - c. Conduct site-specific training for Contractor, SubContractor, and all other authorized site personnel.
 - d. Advise workers on changes related to health and safety at the Site.
 - e. Provide overall supervisory control for all health and safety protocols in effect for the project.
 - f. Conduct periodic training sessions in proper use and maintenance of personal protective equipment and safety practices.
 - g. Work stoppage when safety conditions merit.
 - h. Conduct and supervise any necessary health and safety monitoring.
 - i. Supervise decontamination to ensure complete decontamination of all personnel, tools, and equipment.
 - j. Monitor/evaluate heat and cold stress, utilizing appropriate health and safety practices.
 - k. Review all medical monitoring documentation and prepare any accident/incident reports required.

- l. Assure that all personnel onsite are acquainted with the provisions of the health and safety plans.
- m. Conduct any necessary real-time monitoring.
- n. Prepare and review all health and safety-related documentation.
- o. Conduct any necessary baseline, personal, or daily air sampling and analysis, utilizing appropriate pumps and media.
- p. Coordinate activities of industrial hygiene technician(s), if used.
- q. Inform the HSO of health and safety activities at the Site.

E. Industrial Hygiene Technician:

- 1. The Contractor may use an Industrial Hygiene Technician(s) (IHT) to assist the SSO. An IHT shall have appropriate training equivalent to the SSO in the specific area(s) in which they have responsibility. The IHT shall not serve as a replacement for the SSO, but only function as an assistant. All IHTs must be under the supervision of the SSO.

F. Examining Physician:

- 1. The Contractor shall utilize the services of a licensed physician with experience in the practice of occupational medicine. The examining physician shall be responsible for implementing a medical monitoring program that complies with Title 29 Code of Federal Regulations (CFR), Part 1910.120(f).

1.03 APPLICABLE REQUIREMENTS, GUIDELINES, AND STANDARDS

- A. The Contractor shall be responsible for the development and implementation of a CHSP specific to the scope of work consistent with, but not limited to, the requirements outlined below. In the case that these requirements are conflicting, the one which offers the greatest degree of protection shall be followed.
 - 1. Occupational Safety and Health Administration (OSHA) General Industry Standards found at 29 CFR 1910. The Contractor is made especially aware of the requirements found at 29 CFR 1910.120.
 - 2. OSHA Construction Industry Standards found at Title 29 Code of Federal Regulations, Part 1926.

3. National Fire Protection Association (NFPA), Flammable and Combustible Liquids Code, NFPA 30, 1984.
4. United States Environmental Protection Agency (U.S. EPA), Standard Operating Safety Guidelines, 1984.
5. U.S. Department of Health and Human Services (USDHHS), National Institute of Occupational Safety and Health (NIOSH), "Manual of Analytical Methods," 3rd Edition.
6. American National Standards Institute (ANSI), Practice of Respiratory Protection, Z88.2.
7. ANSI, Protective Footwear, Z358.1 (1981).
8. ANSI, Physical Qualifications for Respirator Use, Z88.6, 1984.
9. ANSI, Practice for Occupational and Educational Eye and Face Protection, Z87.1.
10. U.S. EPA, Office of Occupational Health and Safety, "Guidelines for the Selection of Chemical Protective Clothing, 3rd Edition, February 1987.
11. NIOSH/OSHA/USCG/EPA, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, USDHHS/PHS/CDC/NIOSH.
12. NIOSH Pocket Guide to Chemical Hazards, USDHHS/PHS/CDC/NIOSH, June, 1990.
13. U.S. EPA, Health and Safety Requirements for Personnel Engaged in Field Activities, U.S. EPA Order No. 1440.2.
14. American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values and Biological Exposure Indices, current edition.

1.04 SUBMITTALS

- A. The HSO shall prepare and submit the CHSP, as specified herein, in accordance with Section 01300 - SUBMITTALS.
- B. Daily Safety Logs shall be maintained by the SSO and submitted to the Engineer on a daily basis. The logs shall include items specified in Part 1.21.B of this Section.

- C. Training Logs shall be maintained by the SSO and submitted to the Engineer on request throughout the project and at completion of the work. The logs shall include items specified in Part 1.21.C of this Section. Training and recordkeeping shall be in accordance with OSHA requirements in 29 CFR 1910.120.
- D. Air Monitoring Results Reports shall be maintained by the SSO and submitted to the Engineer on a daily basis. These reports shall include items specified in Part 1.21.D of this Section.
- E. A Close-Out Safety Report shall be submitted by the HSO on completion of the work. This report shall include items specified in Part 1.21.F of this Section.
- F. The Contractor shall submit the name, qualifications, and summary of experience of the Examining Physician with the Contractor's Bid as found in Part 1.11 of this Section.
- G. The HSO shall submit evidence of successful completion of initial medical monitoring requirements to the Engineer for all site personnel prior to allowing these employees onsite.
- H. The HSO shall submit evidence of successful completion of annual and/or termination medical monitoring requirements to the Engineer prior to allowing employees to continue/terminate employment on the project as required by 29 CFR 1910.120.
- I. The SSO shall inform the Engineer immediately of any incidents or accidents and shall submit accident reports to the Engineer within 24 hours of occurrence, as specified in Part 1.21.G of this Section.
- J. Air monitoring equipment calibration/maintenance records shall be maintained by the SSO in accordance with the CHSM. These records shall be submitted to the Engineer on request and/or at the completion of the project.

1.05

**GENERAL REQUIREMENTS FOR CHSP
PREPARATION AND IMPLEMENTATION**

- A. Use of the Site prior to approval of the CHSP will be restricted to mobilization within the support zone. No personnel may enter the exclusion zone, as defined by Contract Drawing Number C-2, until formal approval of the CHSP by the Engineer.
- B. The CHSP shall meet all the requirements of 29 CFR 1910.120 and shall be prepared in accordance with, but not limited to, the requirements outlined in Part 1.03.A of this Section.
- C. Should any unforeseen safety-related hazard become evident during the performance of the work, the SSO shall bring such hazard to the attention of the Engineer for resolution as soon as possible. In the interim, the Contractor shall take necessary action to re-establish and maintain safe working conditions to safeguard onsite personnel, visitors, the public, and the environment.
- D. Should the Contractor seek modification of any portion or provision of the CHSP, such modification shall be requested by the HSO in writing to the Engineer, and if approved, be authorized in writing.
- E. Disregard for the provisions of these Health and Safety Specifications shall be deemed just and sufficient cause for ordering the stopping of all work beyond the support zone until the matter has been rectified to the satisfaction of the Engineer. Any personnel found to be disregarding any provision of the CHSP shall be subject to immediate removal from further site work.
- F. Temporary facilities or special construction procedures required to construct the support zone and contamination reduction zone shall be the responsibility of the Contractor and shall be detailed in the CHSP.

1.06

SITE ORGANIZATION AND KEY PERSONNEL

- A. The CHSP must identify key personnel and alternates responsible for site safety and health. An organizational chart that includes all subContractors and reflects the structure of reporting/responsibility shall be included. The organizational chart shall be supplemented by a narrative description.

1.07 SITE DESCRIPTION

A. The CHSP shall include an introduction stating the main project features, which shall include a review of:

1. Site history.
2. Site processes.
3. Previous worker/public complaints.
4. Site enforcement/litigation activities.

1.08 SITE CHARACTERIZATION AND ANALYSIS

A. The CHSP shall include a site characterization that meets the requirements of 29 CFR 1910.120(c). The Contractor must include, but is not limited to, the following items:

1. Location and approximate size of the Site.
2. Description of the tasks to be performed.
3. A safety and health risk of each task identified.
4. Duration of each planned task.
5. Site topography.
6. Site accessibility by air and road.
7. Pathways for hazardous substance dispersion.
8. Present status and capabilities of emergency response teams in the area.
9. Listing of all known or suspected hazardous substances involved with each task and their chemical, physical, and toxicological properties.
10. Risks associated with hazardous substances including, but not limited to, the following:
 - a. Threshold Limit Values.
 - b. Permissible Exposure Limits.

- c. Recommended Exposure Limits
- d. IDLH concentrations.
- e. Skin absorption and irritation potential.
- f. Eye irritation potential.
- g. Explosion and flammability potential.

1.09 PERSONAL PROTECTIVE EQUIPMENT

- A. The Contractor will provide personal protective equipment to his site employees. All protective clothing and safety equipment shall be used, selected, stored, and maintained properly.
- B. The various levels of protection used on the project shall be utilized, at a minimum, in accordance with the CHSP.
- C. The HSO shall determine the appropriate level of PPE for each task involved in the project as a result of initial site survey, review of existing data, and continuing monitoring.
- D. The HSO shall establish action levels to be followed by the SSO in determining upgrade/downgrade from the level of protection specified for each task in the CHSP. These action levels shall be based upon air monitoring/sampling results and the potential for direct contact with contaminated materials. The action levels shall be fully described in the CHSP along with the formal process to be followed by the Contractor to submit level of protection changes to the Engineer for approval.
- E. As a minimum, Level B protection should be worn when handling containers that cannot reasonably be classified as either being drill cuttings, groundwater, decontamination water, PPE, tank scale or bottoms, empty containers, fuel oil, antifreeze, or other low-risk material.
- F. Level C PPE shall be worn, as a minimum, whenever air monitoring readings in the breathing zone exceed 1 ppm and Level B if they exceed 10.0 ppm.

1.10 PERSONAL AIR MONITORING

- A. The HSO shall implement and oversee a personal air monitoring plan as specified in the CHSP.

MEDICAL MONITORING

- A. The HSO, in conjunction with the Examining Physician, shall detail the medical monitoring program in the CHSP. The program shall, at a minimum, outline the requirements specified below.
1. The Examining Physician shall be utilized to determine the appropriate biological testing parameters, conduct the examinations, review the analytical data, and approve site employees for work onsite.
 2. All onsite employees must successfully complete an initial physical examination prior to being approved for site work unless the individual participates in a regular medical monitoring program which meets the requirements of 29 CFR 1910.120. Employees shall not perform any work involving hazardous materials between the time of their initial examination and commencement of work on the project. A completed Medical Approval Form, signed by the examining physician, must be submitted to the Engineer prior to the employee performing work in the exclusion zone or handling hazardous materials.
 3. A termination examination shall be provided for each employee upon completion of site assignment unless the individual participates in a regular medical monitoring program. This examination shall be performed prior to the employee performing work on another assignment, or within 10 days after reassignment/termination, whichever is sooner. The Contractor will be responsible for ensuring that site employees are available for re-examination in the event of abnormal test results or requirements of re-examination by the Occupational Physician.
 4. Periodic examinations of all onsite employees shall be performed in accordance with the requirements stipulated in the CHSP at least annually. A completed Medical Approval Form must be submitted following this examination prior to re-approving the employee for site work.
 5. The Medical Monitoring Program shall describe the circumstances under which non-scheduled medical examinations will be conducted. At a minimum, the following circumstances shall be included:

- a. After acute exposure to toxic or hazardous material.
 - b. At the discretion of the HSO, Occupational Physician, or the Engineer when a site employee has been exposed to high levels of hazardous materials.
 - c. Upon the request of an employee showing demonstrated symptoms of exposure to hazardous materials.
- 6. The actual parameters selected shall be the responsibility of the Examining Physician and shall meet the requirements of U.S. EPA, 29 CFR 1910.134, 1910.120, and ANSI Z88.2.
 - 7. The Contractor shall maintain all medical surveillance records and make these records available to the Engineer or other regulatory agencies upon request by appropriate officials following all rules of confidentiality prescribed under 29 CFR 1910.120. These records shall be maintained for a period of 30 years.
 - 8. Any employee who develops a lost-time injury or illness during the period of the Contract must be evaluated by the Examining Physician. The employee's supervisor shall be provided with a written statement indicating the employee's fitness (ability to return to work), signed by the Examining Physician, prior to allowing the employee to re-enter the work site. A copy of this written statement shall be submitted to the Engineer. An Accident Report describing the events leading up to and causing the injury or illness shall be submitted to the Engineer.

1.12 SITE CONTROL

- A. To control the spread of contamination and the flow of personnel and materials into and out of the work area, the Contractor shall establish a site control section in the CHSP. This section shall describe the methodology to be used by the SSO in determining the modification of work zone designations, procedures to limit the spread of contamination, and general limitations to be observed by site personnel.
- B. Support Zone:
 - 1. The support zone shall be established on the Site and is defined as the area outside the zone of significant contamination. The support zone shall be clearly delineated and shall be secured against active or passive contamination from the work site. The function of the support zone is to provide:

- a. An entry area for personnel, material, and equipment into the exclusion zone of site operations.
 - b. An exit area for decontaminated personnel, materials, and equipment from the contamination reduction zone of site operations.
 - c. Location for support facilities.
 - d. A storage area for clean safety and work equipment.
- C. No vehicles or equipment used in the exclusion zone shall be permitted to enter the support zone until fully decontaminated, unless provisions have been made to prevent the vehicles/equipment from being contaminated.
- D. No vehicles or equipment used for personal reasons (supervisor's vehicles, personal tools, etc.) shall be permitted to enter the contamination reduction zone or exclusion zone.
- E. The Site Control section of the CHSP shall fully describe onsite traffic flow and personnel access to work area procedures. The Contractor shall transport equipment and personnel directly from the drum storage pad to the equipment and personnel temporary decontamination area. Positive means must be established to prevent equipment/vehicles from becoming contaminated or the appearance that they have become contaminated.
- F. The exclusion zone, contamination reduction zone, and the support zone shall be as identified by Contract Drawing Number C-2, and shall be delineated by a sturdy temporary fence, such as high visibility construction fence.

1.13 TRAINING AND INFORMATION

- A. The Contractor shall provide all training and information, as required by 29 CFR 1910.120, to site employees. Proof of training, as required by this paragraph, shall be provided to the Engineer prior to permitting any employee to engage in site activities.
- B. All site workers must successfully complete 40 hours of basic hazardous waste training and 24 hours of "on-the-job" training as required by 29 CFR 1910.120. Additionally, all supervisors must complete an additional 8 hours of training as required by 29 CFR 1910.120. The training described above is considered to be a qualification for work, and proof of compliance shall be required prior to site assignment.

- C. Site-specific training for all Contractor employees shall be provided by the Contractor. No individual shall be permitted to enter the exclusion zone without completing this training.
- D. The site-specific training program shall be developed and initially presented by the HSO. Subsequent presentations may be made by the SSO under the direction of the HSO. The training program shall be of sufficient time to allow each employee in the class to gain "hands-on" familiarity with site safety equipment and to understand site working procedures.
- E. The Contractor shall supply the Engineer with a list of all employees successfully completing the site-specific training program. The SSO shall maintain the original copies of all questionnaires until requested by the Engineer or until project completion.
- F. The SSO shall conduct daily safety meetings with onsite employees. Opportunity shall be provided for employees to voice safety-related concerns. The SSO shall submit to the Engineer a synopsis of each meeting including topics covered, safety-related concerns, action items to be addressed, status of previous items, and a signed attendance list. The list shall be posted daily in the SSO office.

1.14 ENGINEERING CONTROLS AND WORK PRACTICES

- A. The CHSP shall address the engineering controls and safe work practices to be implemented for the work covered by these Specifications. These shall include, but not be limited to, the following:
 - 1. Safety requirements in accordance with 29 CFR 1910.120 for opening and sampling drums including remote and manual opening methods, criteria for determining when each method shall be used, and methods for drum handling.
 - 2. Protocols for operation of heavy construction equipment in accordance with 29 CFR 1926.
 - 3. Protocols for working around heavy equipment.
 - 4. Provisions for documenting site employee daily activities. As part of these provisions the HSO shall develop a daily work permit system to be implemented by the SSO. Under this system the SSO will be required to issue permits to all task/job supervisors covering specific activities for the day. Included on the permits will be the following information:

- a. Names of all employees performing the task.
 - b. Specific PPE requirements for the task.
 - c. A description of the task being performed.
 - d. Date(s) for which the permit is applicable.
 - e. Signature of SSO and Supervisor.
 - f. Specific work instructions such as monitoring equipment required, safety inspections required, safety equipment necessary, fire watch, etc.
5. These permits shall be available at each work site and shall be explained to each worker by the supervisor in charge of each task.
 6. A copy of each permit shall be maintained by the SSO as part of the project records. The SSO shall provide these completed permits to the Engineer on a weekly basis.

1.15 PERSONNEL DECONTAMINATION AND PERSONAL HYGIENE

- A. Onsite personnel performing or supervising work within the Contamination reduction or exclusion zones or exposed to hazardous chemical vapors, liquids, or contaminated solids shall adhere to the requirements of this section.
- B. The CHSP shall describe, in detail, the personnel decontamination protocols to be followed on this project. Additionally, the location(s) of personnel decontamination stations shall be shown on the site facilities drawing.
- C. Used disposable PPE shall not be reused and shall be placed inside designated disposal containers provided for that purpose in the contamination reduction zone.
- D. Disposable work clothing and waste materials shall be disposed of along with similar materials already being removed from the site.
- E. Appropriate decontamination facilities and procedures shall be maintained and utilized for nondisposable protective equipment.

- F. Except for attire worn only outside the exclusion zone or contamination reduction zone, no personal work clothes, shoes, or boots shall be worn or carried beyond the support zone. Soiled work clothes (excluding socks and undergarments) shall be laundered by the Contractor. Other nondisposable equipment such as boots, gloves, and respirators shall be washed down in the contamination reduction zone prior to entering the support zone.
- G. The Contractor shall supply the following support zone facilities for use by onsite personnel:
1. Shower Facility: This facility shall include a minimum of one metal locker capable of accepting a padlock for security for each onsite personnel, a shower room or stalls with a minimum of one shower head for every five site workers, a floor drain from the shower room and/or stalls connected to a wastewater collection system, a minimum of two hand basins, two separate entrances (one from the contamination reduction zone side of the facility and one from the support zone side of the facility), and sufficient benches for seating all onsite personnel.
 2. The lockers described in Part 1.15.G.1 above are only to be used to store street clothes and valuables. No personal protective equipment and/or work clothes are to be stored in these lockers.
 3. The shower facility shall be kept in a clean condition on a daily basis by the Contractor. Additionally, the shower room or stalls shall be cleaned with detergent and disinfected, at a minimum, on a weekly basis.
 4. The Contractor shall supply soap, towels, and wash clothes for all onsite personnel. These supplies shall be replenished and/or laundered on a daily basis.
 5. Laundry: All outer clothing (i.e., coveralls or shirt and pants) shall be laundered onsite or the work subContracted to a laundering service approved by the Engineer. If an offsite laundry is utilized, it shall be notified in writing of the potential hazardous contaminants on clothing so that appropriate precautions can be taken in handling and laundering on a daily basis. Clothing shall be washed using laundry detergent or soap. Laundry service shall provide for the daily pickup of outer work clothing for all onsite personnel. All clothing must be laundered and ready for use within 24 hours of pickup or supply sufficient changes of clean clothing until laundered clothing is returned.

6. Lunchroom: A lunchroom shall be constructed and equipped in accordance with Section 01500 - TEMPORARY FACILITIES. This facility shall be cleaned on a daily basis. A floor drain is optional.
7. Smoking Area: A smoking area shall be set aside outside of the lunchroom.

1.16 EQUIPMENT DECONTAMINATION

- A. The CHSP shall describe, in detail, the protocols established for equipment decontamination. The general location of temporary decontamination facilities to be established by the Contractor is shown on Contract Drawing C-2.

1.17 GENERAL SITE RULES

- A. The HSO shall develop a list of general site rules based on the requirements of these specifications and the CHSP.

1.18 EMERGENCY AND FIRST-AID REQUIREMENTS

- A. The CHSP shall describe the emergency and first-aid protocols to be utilized during work on the project. The following items must be included and discussed, at a minimum.
 1. Emergency medical care services shall be arranged at a nearby medical facility and emergency routes established prior to any work onsite. The staff at the facility shall be advised of potential medical emergencies including the possibility of contamination of skin and clothing by specific chemicals from the Site. Procedures and facilities for emergency communications with health and emergency services shall be established.
 2. Site support vehicles designated for use in the transportation of injured or ill personnel shall be provided with a route map to the medical facility(ies). At all times at least two onsite employees shall be thoroughly familiar with the emergency routes to the medical facility(ies).
 3. At least one person certified in First Aid and Cardio-Pulmonary Resuscitation (CPR) shall be on the Site during all site activities. This person may perform other duties, but must be immediately available to render first aid when needed. Certification shall be by the American Red Cross or other approved agency.

4. Fire extinguishers with a minimum rating of 2A-10B:C shall be provided at all site facilities and at any other site locations where flammable or combustible materials present a fire risk.
5. Emergency deluge showers and eyewash stations shall be provided for immediate use and shall be protected from contamination in areas where activities involve handling of materials that may be hazardous to the eyes or other exposed portions of the body.
6. Two Self-Contained Breathing Apparatus shall be dedicated for emergency use only and maintained onsite in the contamination reduction zone. All onsite employees shall be informed of their location, and trained in their use.

1.19 HANDLING DRUMS AND CONTAINERS

- A. The HSO shall describe the methods to be followed during the handling of all drums and containers found onsite. The methods developed and described in the CHSP shall meet, at a minimum, the requirements set forth at 29 CFR 1910.120(j). Of particular importance will be the systematic approach taken by the Contractor to classify, open, sample, and stage the containers.
- B. Drum dollies or other similar equipment shall be used to move drums.
- C. Drums that cannot be reasonably classified as safe to move, shall not be moved until precautions have been taken to prevent spills.
- D. The steps to be taken in the event of a spill shall be defined for each of the types of materials anticipated to be encountered within the drums.

1.20 CONTINGENCY AND EMERGENCY RESPONSE

- A. The Contractor shall develop a Contingency and Emergency Response Plan as specified in 29 CFR 1910.120(l) to be included in the CHSP. This plan shall be capable of being a "stand-alone" document.
- B. Emergency Communication:
 1. The Contractor shall establish emergency communications with health and emergency services. The name of this facility, name of contact, emergency routes, and emergency communications arrangement shall be posted at all project telephones.

C. Emergency Reporting:

1. In the event that an accident or some other incident such as an explosion, a theft of any hazardous material, or an exposure to toxic chemical occurs during the course of the project, the Engineer shall be telephoned immediately and receive a written notification within 24 hours. The report shall include the following items:
 - a. Name, organization, telephone number, and location of the Contractor.
 - b. Name and title of the person(s) reporting.
 - c. Location of accident/incident, i.e., site location, facility name.
 - d. Date and time of accident/incident.
 - e. Brief summary of accident/incident giving pertinent details including type of operation ongoing at time of accident.
 - f. Cause of accident/incident, if known.
 - g. Casualties (fatalities, disabling injuries).
 - h. Details of any existing chemical hazard or contamination.
 - i. Estimated property damage, if applicable.
 - j. Nature of damage; effect on Contract schedule.
 - k. Action taken by Contractor to ensure safety and security.
 - l. Other damage or injuries sustained (public or private).

D. Contingency Planning:

1. Procedures and Contractor personnel responsibilities for potential emergencies shall be identified in the CHSP. Emphasis in the contingency planning section shall be placed on procedures.

1.21 LOGS, REPORTS, AND RECORDKEEPING

- A. The SSO shall maintain logs and reports covering the implementation of the CHSP. These shall include, but not be limited to: Daily Safety Logs, Training Logs, Air Monitoring Results Reports, Close-Out Safety Reports, Accident Reports, Calibration/Maintenance Records, and Medical Approval Forms. These logs and records will be considered the ECC Trust property. The original of the logs and records shall be submitted to the Engineer and a copy maintained by the Contractor.
- B. Daily Safety Logs shall be completed by the SSO and submitted to the Engineer daily. The format for the logs shall be shown in the CHSP and include the following minimum information:
 - 1. Date.
 - 2. Project name.
 - 3. Work area(s) checked.
 - 4. Employees present in work area(s).
 - 5. PPE in use.
 - 6. Monitoring equipment in use.
 - 7. Accidents.
 - 8. Breach of procedures.
 - 9. Description of air samples and/or monitoring results.
 - 10. Signature of preparer.
- C. Training Logs shall be completed by the SSO and submitted to the Engineer upon request or at the completion of the work. These logs shall include the following information and the format shown in the CHSP:
 - 1. Date.
 - 2. Project name.
 - 3. Employees in attendance and signature.

4. Name of employee's company.
5. Visitors in attendance.
6. Description of training activity and/or topics covered.
7. Equipment used.
8. Signature of instructor.

These logs shall be used to document all onsite training.

D. Air Monitoring Results Reports shall be completed by the SSO or IHT and submitted to the Engineer daily. These reports shall follow the format shown in the CHSP and include the following minimum information:

1. Date.
2. Project name.
3. Type of equipment used.
4. Equipment I.D. number.
5. Monitoring results for each work location with time of readings.
6. Analytical results for personal exposure or perimeter sampling.
7. Personnel or location monitored/sampled with description of activity being performed.
8. Sample numbers.
9. Miscellaneous information related to monitoring/sampling performed.

E. A Close-Out Safety Report shall be prepared and submitted to the Engineer within 10 working days following completion of the work. The following minimum information must be included:

1. Summary of the Daily Safety Logs which outlines the overall performance of Health and Safety by the Contractor.
2. Documentation of termination medical examinations for all site personnel.

3. Documentation showing that all Contractor vehicles and equipment have been decontaminated in compliance with the CHSP.
4. Summary of the procedures used to decontaminate all temporary site facilities.
5. Total man-hours worked.
6. Total lost work days.
7. Total OSHA recordable injuries/illnesses.
8. Description of any outstanding lost work day cases.
9. Description of any problems relating to medical surveillance including:
 - a. Employees showing abnormal termination examination results.
 - b. Employees required to be retested prior to final clearance.
 - c. Any outstanding claims resulting from occupational injuries/illnesses.

G. Accident Reports shall be prepared by the SSO and submitted to the Engineer within 24 hours of occurrence. These reports shall detail all actions, conditions, and circumstances leading up to the accident. Additionally, the report must include the results of the investigation performed by the Contractor, which detail the specific cause(s) of the accident and procedures and/or controls to be implemented to ensure it does not recur. The specific form to be submitted shall be included in the CHSP.

H. A Calibration/Maintenance Record Form shall be maintained for all air monitoring and sampling equipment. Each form shall include, at a minimum, the following information:

1. Description of equipment.
2. Equipment I.D. number.
3. Date and time of calibration.
4. Specific calibration documentation.
5. Signature of personnel calibrating the equipment.

6. Description and date of onsite maintenance performed.

7. Signature of person performing maintenance.

These records will be maintained by the SSO and submitted to the Engineer upon request or at the end of the work. All calibration and maintenance shall be performed in accordance with the attached Quality Assurance Project Plan (QAPP). The format to be used for each type of air monitoring/sampling equipment shall be included in the CHSP.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

Not applicable.

END OF SECTION

APPENDIX B

COMPATIBILITY TESTING PROCEDURES

APPENDIX B

COMPATIBILITY TESTING

B1.0 OVERVIEW

The analyses outlined in this section will be conducted on drum samples in order to assess the compatibility of wastes encountered onsite for transportation according to U.S. Department of Transportation requirements (40 CFR Parts 171 through 179). Wastes are evaluated according to Figure B-1, the Compatibility Testing Flow Chart, to address the following requirements:

- Determine the proper shipping name
- Determine the hazard class
- Select the proper UN/NA identification number
- Determine mode of transport
- Select the proper label or labels and apply as required
- Determine to select the proper packages
- Mark the packages
- Determine and provide the proper placards
- Determine waste which can be "bulked" for transportation

Compatibility testing will aid in satisfying these by:

- Providing a physical description of the waste (viscosity color, transparency, homogeneity, turbidity, etc.)
- Identifying corrosive materials ($\text{pH} \leq 2$, or ≥ 12.5)
- Determine water solubility, reactivity
- Identify organic acids, bases
- Determine the presence of oxidizing materials
- Determine flammability and combustibility
- Determine the presence of chlorinated hydrocarbons

All analytical data will be summarized on data sheets (Figure B-2).

B2.0 SUMMARY OF COMPATIBILITY METHODS

Methods utilized are briefly summarized below. Complete analytical methods can be found in U.S. EPA Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, SW-846, 1985. Figure B-1 depicts the decision-making process regarding the use of these methods.

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FLOW CHART FOR COMPATIBILITY TESTING

ENVIRO-CHEM SUPERFUND SITE

ZIONSVILLE, IN

CLIENT: ENVIRONMENTAL CONSERVATION & CHEMICAL CORP. TRUST

JOB NO. 2455-002

SCALE: NONE

FIGURE
NUMBER

B-1

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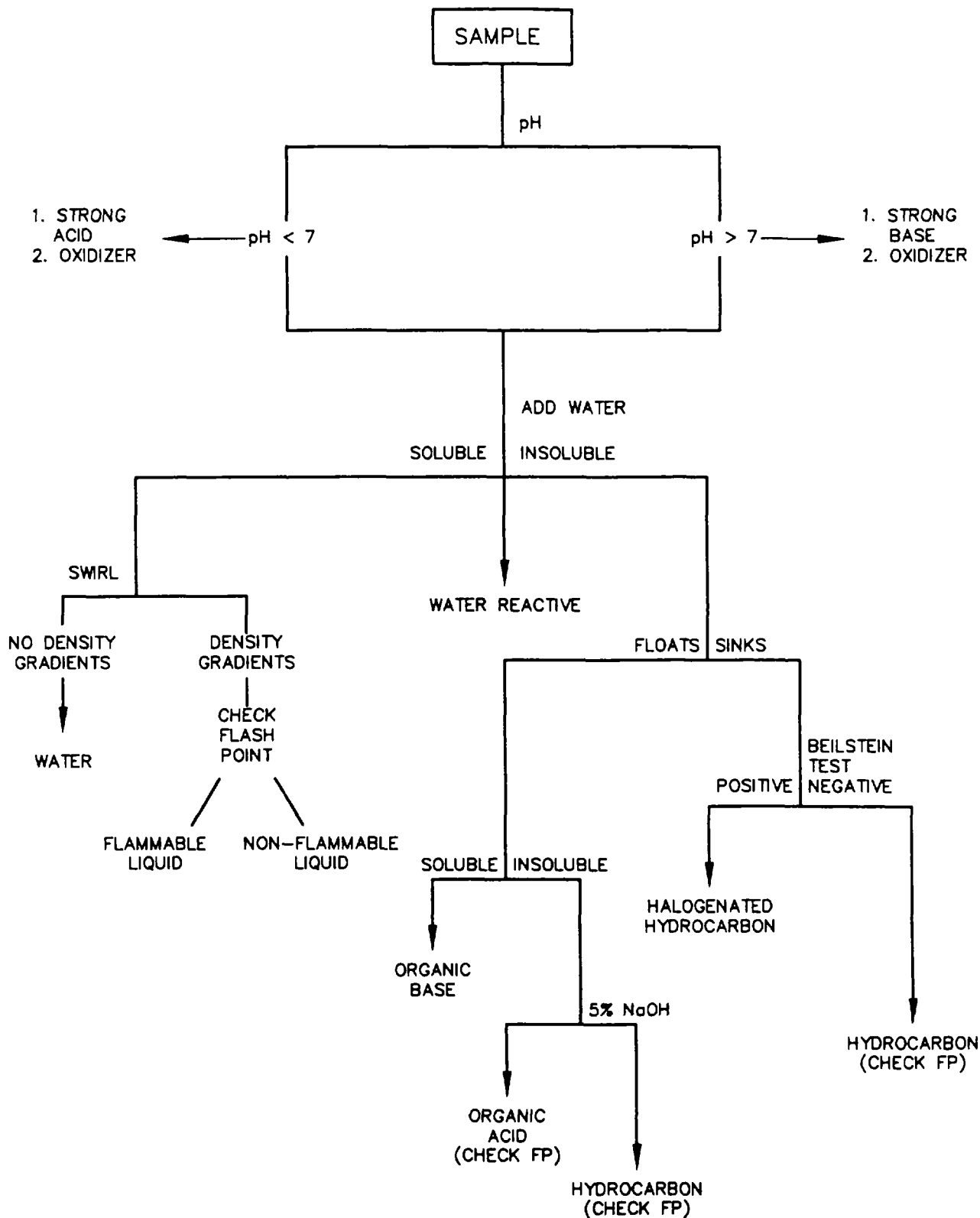


FIGURE B-2

ANALYTICAL DATA SHEET COMPATIBILITY TESTING

Drum ID No.: _____ Date: _____

Estimated Liquid Quantity: _____ Drum Condition: _____

Sampler's Name: _____ Analyst's Name: _____

Sampler's Signature: _____ Analyst's Signature: _____

Physical Appearance of Contents

Color: _____ Transparency: _____

Viscosity: _____ Homogeneity: _____

Other: _____

Chemical Data

pH: _____ Water Soluble: _____

HCl Soluble: _____ NaOH Soluble: _____

KI-Starch Paper: _____ Oxidizer: _____

Cyanide Present: _____

Flammability

HNU Reading: _____ ppm LEL/O₂ Reading: _____ %

BIC Test: _____ SETA Closed Cup: _____ °F

Material Is: Flammable: _____ Combustible: _____ Nonflammable: _____

Beilstein Test - Chlorinated Hydrocarbons: Present: _____ Not Present: _____

Material To Be Shipped As: Ignitable: _____ Reactive: _____ Corrosive: _____

Signature of Designated Coordinator: _____

B2.1 Describe Physical Nature of Sample

Include color, viscosity (use water as reference material), opacity or transparency, homogeneity, turbidity, number of phases, etc.

B2.2 Determination of pH

- Meter

Immerse probe of properly calibrated instrument into the sample and read pH.

- Paper

For a liquid, dip the pH paper into the solution and read the pH from the scale on the pH paper container.

For a solid, wet and pH paper with a few drops of water, touch the wet pH paper to the solid material and read the pH from the scale on the pH paper container.

B2.3 Determination of Water Solubility

- Soluble

If 0.2 mL (0.1 g of a solid) sample completely mixes with 3 mL water and forms no precipitate or cloudy solution.

1. No density gradients indicate that the sample is possibly water.
2. If density gradients are present, check flash point (see Step 7).

- Insoluble

If original quantity of material does not go into solution but becomes soluble when the volume of water is doubled.

1. If the sample floats, test for an organic base and/or organic acid (use amounts of solute and solvent as described above in the water-solubility procedure).
 - Organic base - react sample with 5 percent HCl. Solubility indicates the presence of an organic base.
 - Organic acid - react with 5 percent NaOH. Solubility indicates the presence of an organic acid.
2. If the sample sinks, test for halogenated hydrocarbons (see Step 7).

If pH is less than 7, check for the presence of oxidizers (see Step 4). (One exception is an aqueous solution of sodium hypochlorite. The solution has a high pH and would not be tested for the presence of an oxidizing material). If pH is greater than or equal to 7, check for cyanides (see Step 5).

B2.4 Determination of Flammability

Four measurement methods assist in determining the flammable nature of the sample. These are:

- HNU photoionizer measurements
- CGI meter measurements
- BIC qualitative test
- SETA flash closed-cup measurements

The sample is considered to be flammable if:

1. The SETA flash point is less than 100°F or if SETA is not known.
2. The CGI reading is greater than 1 percent.
3. HNU reading (10.2 probe, 9.8 scan) is greater than 200 ppm and the BIC test (see below for description) is (+), (+/-).
4. The CGI reading is less than 1 percent, the HNU reading is less than 200 ppm, but the BIC test is (+).

The sample is considered to be combustible if:

1. The CGI reading is less than 1 percent
2. The HNU reading is less than 200 ppm
3. The BIC test is (+/-) or (-)

The BIC test procedure:

- Apply a small quantity of a liquid sample onto a solid support media (such as a cotton swab) and expose to an open flame source
- Observe and record the result on the data sheet given the three possibilities:
 - (+) - flammable, ignites readily and vigorously upon exposure to a flame source, estimated flash point less than 100°F
 - (+/-) - combustible, will eventually ignite and sustain a flame upon exposure to a flame source, flash point estimated to be less than 200°F
 - (-) - nonflammable and noncombustible, does not ignite or sustain flame, flash point estimated to be greater than 200°F

B2.5 Beilstein Test (Chlorinated Hydrocarbon Determination)

For all samples which are insoluble and show a specific gravity of greater than 1 or which are slightly soluble and give an HNU reading of 200 or greater or give any positive reading on a combustible gas indicator.

Use gloves so as to avoid depositing chlorides from skin on copper wire that is used in the test.

- Heat copper wire until a yellow flame with no green appears
- Cool wire by waving in air for 10 to 15 seconds
- Dip wire into sample
- Insert sample-coated wire into flame
- A green flame indicates that chlorinated compounds may be present

B3.0 COMPATIBILITY TESTING QA/QC

Quality control procedures for these analyses include:

- Calibration of equipment (if appropriate)
- Duplicate or sample replicate analysis (if applicable)
- Analysis of standard or known matrix content

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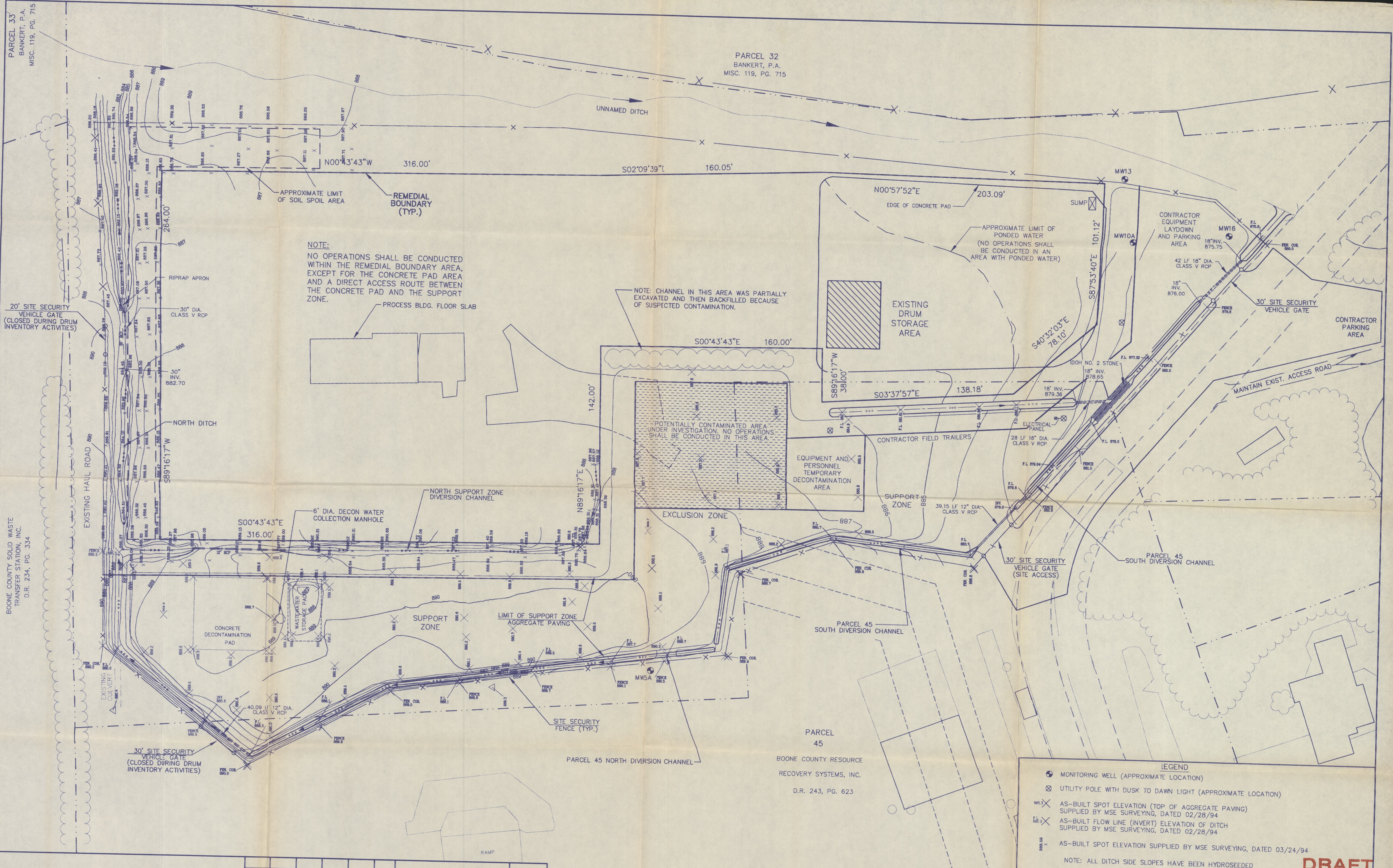


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DRUM INVENTORY AND STAGING OPERATIONS PLAN

ENVIRO-CHEM SUPERFUND SITE		ZIONSVILLE, IN	
CLIENT: ENVIRONMENTAL CONSERVATION AND CHEMICAL CORPORATION TRUST		JOB NO.	2455-002
SCALE AS SHOWN	C-2		REV 0



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